



# SWAMP THINGS

## NOTES FROM U.S. EPA'S WETLANDS DIVISION (WD)

### *Viewpoint: Communities Restoring Wetlands*

Over half of the wetlands in the contiguous 48 states had been lost before we more fully understood their environmental and economic importance. Some regions have experienced very high rates of loss, and restoration of wetlands is essential to bring back healthy functioning aquatic ecosystems. Since the late 1980's the nation's goals for wetlands have included an increase in the quality and quantity of wetlands.

There is an ever-growing number of organizations involved in restoring wetlands and river corridors. These efforts range from large programs like the Department of Agriculture's Wetlands and Conservation Reserve programs, which involve hundreds of thousands of acres, to local scale projects as small as a few acres.

As part of our wetlands program, EPA seeks to contribute to the national agenda to restore wetlands. One of the ways in which we are involved is by supporting community-based restoration programs and projects. EPA has been working with States, Tribes and local governments to organize programs to protect our waters on a watershed basis, involving communities in identifying the most significant environmental problems in their waters and devising ways to address them. The watershed approach provides the opportunity to identify the kind of restoration that will heal impaired waters, priority sites for restoration projects, and the programs that are needed to achieve restoration goals.

See Viewpoint, Page 2

### FOCUS ON:

### September 24-25 State/ Federal Workshop

The Association of Wetland Managers and EPA are hosting a workshop for state and federal wetlands program staff called *Reducing Duplication and Improving Cooperation* on September 24 and 25, 1997 in Springfield, Virginia. Immediately before the workshop on Tuesday, September 23 is a one-day forum on Restoration of River Corridors and Wetlands. While the September 24-25 Workshop is designed only for state and federal program staff, the restoration forum is intended to also include those representing tribes, non-profits, local governments, and foundations.

The objectives of the *Reducing Duplication and Improving Coordination* workshop are to share information on initiatives that improve the way federal and state agencies work together, to examine what is working and what is not, to identify problems and impediments, and to suggest productive future directions. As state agencies continue to play a more active role in wetlands regulation, the working relationship among federal and state agencies becomes ever more important. When state and federal agencies work together smoothly and effectively, our wetlands are protected better and the American public is well-served. The workshop will include panel discussions with state representatives describing approaches they are using in their relationships with federal agency partners. These panels will discuss mechanisms being used to coordinate Section 401 programs, coastal zone consistency reviews, federal and state Section 404 permitting, wetland assessment, mitigation/compensation requirements, mitigation banking, and wetlands/watershed management. Other topics to be addressed include Congressional action on wetlands, the wetlands provisions of the Farm Bill, use of the Clean Water Act State Revolving Fund for wetlands,

*Continued on Page 2, Focus On*

**Meeting Report: The Biological Assessment of  
Wetlands Working Group - See Page 8**

*Focus On, from page 1*

improving public outreach, technology transfer, and cooperative public/private sector approaches.

The September 24 and 25 workshop is scheduled when EPA's Regional wetlands program staff are in Springfield for a national meeting. In 1996 EPA for the first time invited State participation in our annual National Wetlands Meeting. This turned out to be a very successful innovation, which led to the decision to schedule more joint state and federal sessions in this year's agenda. With nationwide participation, federal and state staff have the opportunity to discuss new approaches, successes, and lessons learned in areas other than the EPA Region in which they are located.

The forum on restoration of river corridors and wetlands on Tuesday, September 23, is intended to broaden and strengthen relationships among restoration partners. Over the course of the past year, EPA has become increasingly aware of restoration successes that involve multiple cooperating partners. To help EPA develop our program for restoration, we have hosted over the past year a series of meetings with presentations at each by three or four organizations involved in restoration. There is lot of interest among these organizations in learning about each others' programs for restoration, and the kinds of projects in which they are engaged.

To help make connections for restoration, EPA has developed a restoration handbook with information about partnership organizations, and has developed a restoration web site, which will be operational in September. The September 23 Forum will also help build the restoration network, with panels on building a diverse partnership, large landscape-scale restoration efforts, and small community-based projects. It will also elicit suggestions from participants on how to advance a restoration agenda in the U.S. An agenda for the restoration forum with an EPA contact and phone number is on pages 11 and 12. State and federal agency staff interested in attending the workshop on *Reducing Duplication and Improving Coordination* should contact the Association of State Wetland Managers at 518-872-1804.

*Viewpoint, from page 1*

EPA is most interested in building partnerships for restoration (see "Focus On" article on the September 23 Restoration Workshop). This year EPA has helped a number of restoration partnership projects by providing financial assistance when the partners had secured some funding but were short of that necessary to make the project happen. Some examples of EPA's involvement with funding from this fiscal year are:

- ⇒ With the State of New Jersey and the New Jersey Audubon Society, initiating a Backyard Sanctuary Program to provide habitat for migratory birds at a critical point on the Eastern Flyway.
- ⇒ EPA and the National Association of Counties provided funding to create three wetlands and to establish a watershed monitoring program in Erie County, New York. Others involved in the project are the local government, the Buffalo and Erie County Private Industry Council, a disadvantaged youth organization, and a volunteer service organization (Americorps).
- ⇒ With EPA support, the city of Grand Junction Colorado, the U.S. Fish and Wildlife Service, and an organization called the Wetlands Initiative Focus Group are restoring Colorado River backwater spawning habitat for several species of endangered fish.

From these and over twenty other projects in which EPA has participated this year, we are learning more about the ways that public agencies, private interests, and non-profit groups are cooperating in communities and watersheds to restore wetlands and river corridors. There is a powerful interest in such restoration projects; EPA received over \$50 million in grant applications this year. Because EPA is in a position to fund only a small fraction of these requests, we hope to provide a service by helping potential partners for restoration to find others who are willing to pool resources in partnership projects. The tools we will use for this are a new restoration web site, to be opened this month, a restoration handbook with information on partnership organizations, and workshops for sharing information.

Restoration partnerships bring challenge and promise. A major challenge is working across organizations that have differing missions, expertise and ways of doing business. The promise is that by working together at the community level we can focus on wetlands and rivers, and their values to the people who live nearby, which makes it possible to accomplish far more restoration than we ever could working on our own.

- John Meagher, Director of the Wetlands Division  
e-mail: meagher.john@epamail.epa.gov

## ACTIVITIES UPDATE

*Note: A contact is listed after each item in this section, in a format that provides e-mail addresses by adding the following to the names as listed: @epamail.epa.gov. For example, the e-mail for the contact for the first item is: witten.matthew@epamail.epa.gov*

### STATE/TRIBAL ACTIVITIES

**Tribal Outreach.** On Friday, August 8, three representatives of the Taos Pueblo Indians met with Wetlands Division (WD) staff to discuss watershed and wetlands management on their reservation near Taos, New Mexico. The Taos Pueblo have been conducting water quality monitoring of their wetlands and streams through benthic samples using volunteers as well as staff. They also train members of other tribes in the region, and plan to partner with nearby laboratories and universities (as well as other federal agencies) to disseminate information to other tribes and communities regarding the use of biocriteria in water quality and wetlands assessments. The wetland areas on the reservation are of cultural as well as ecological significance to the Taos Pueblo, with many of the indigenous plants serving as the basis of traditional rituals. (witten.matthew)



## FEDERAL ACTIVITIES

### 1998 Update for the North American Waterfowl Management Plan (NAWMP).

On July 2, Ken Williams, Committee Co-Chair of the NAWMP Plan Committee, briefed WD staff on Phase II of the 1998 Update. Phase II contains a proposed framework and strategy for the next 15 years. The focus of the framework is on science-based waterfowl conservation, building and maintaining partnerships, and flexibility in Plan implementation. The strategy recognizes the maintenance and sustained use of habitats by waterfowl to ensure long-term conservation. On July 22, EPA submitted recommendations which support the framework's objectives, including placing an emphasis on the chemical and physical, in addition to the biological, components of science-based waterfowl conservation, and incorporating monitoring and assessment into the framework to improve the delivery of waterfowl conservation. The Plan Committee will convene in August to receive the recommendations, set directions, and begin drafting the 1998 North American Waterfowl Management Plan. (wesley.marjorie)

**Meeting on Agricultural Mitigation Program.** On July 1, we met with representatives from the Agricultural Conservation Innovation Center (ACIC) to discuss a conceptual proposal to establish a low-cost wetlands mitigation program for farmers seeking to convert frequently-cropped wetlands.

ACIC is meeting with each of the federal regulatory and resource agencies in the early stages of their effort to identify issues and concerns that will need to be addressed as they put together a pilot for the mitigation program. ACIC is a new non-profit organization, which is working closely with NRCS to develop new programs and incentives to help solve environmental problems associated with the nation's farming operations. (kelsch.thomas)



## WATERSHED ACTIVITIES

**Top Ten Watershed Lessons Learned.** OWOW unveiled a new website called "Top Ten Watershed Lessons Learned" (<http://www.epa.gov/owow/watershed/lessons/>). EPA, in partnership with many others, is pursuing a watershed approach to protecting our lakes, rivers, wetlands, estuaries, and streams. Important lessons have been learned by us and our partners that are worth sharing. This site was developed in partnership with over 100 practitioners and their supporters. The top 10 watershed lessons learned are:

1. The best plans have clear

- visions, goals and action items
2. Good leaders are committed and empower others
  3. Having a coordinator at the watershed level is desirable
  4. Environmental, economic, and social values are compatible
  5. Plans only succeed if implemented
  6. Partnerships equal power
  7. Good tools are available
  8. Measure, communicate, and account for progress
  9. Education and involvement drive action
  10. Build on small successes

For more information, contact Ben Ficks, US EPA Watershed Outreach Coordinator at [ficks.benjoy@epamail.epa.gov](mailto:ficks.benjoy@epamail.epa.gov) or 260-8652. ([cahanap.concepcion](http://cahanap.concepcion))

#### **State Revolving Fund (SRF)**

**Meeting.** WD representatives met with staff from EPA's Office of Wastewater Management on July 10 to discuss potential use of the multi-billion dollar SRF to fund wetland projects, such as wetland mitigation banks, wetlands for stormwater management, wetlands as water quality buffers, and transferable development rights. With use of the SRF for wetlands, a revenue stream must be available to reimburse the fund, and sources could be wastewater or stormwater management fees, mitigation banking credit sales, or local revenues for open space acquisition. Fact sheets will be developed outlining the various case studies where these funds have been used for wetland projects. ([eargle.frances](http://eargle.frances))

## **CONGRESS**

**Senate Environment and Public Works Subcommittee Questions and Answers.** As a follow-up to the June 26 Senate Environment and Public Works wetlands subcommittee hearing on recent developments in the Section 404 regulatory program, WD prepared responses to additional questions raised by members. Specifically, the chair of the full committee, Senator John Chafee (R-RI), posed questions about the effects of the recent court decision which invalidated the Tulloch Rule (a decision stayed pending appeal) and the status of mitigation banking; Senator Barbara Boxer (D-CA) inquired about the economic benefits of wetlands, trends in wetland losses and gains nationwide and in California, and the environmental impacts, both nationwide and in California, if the Tulloch Rule were not reinstated. ([kelsch.thomas](mailto:kelsch.thomas) or [mali.peter](mailto:mali.peter))

## **WETLANDS SCIENCE AND TOOLS**

**National Spatial Data Sharing Agreement.** On August 5, the Nature Conservancy briefed EPA regarding the improved availability of spatial biodiversity data from the 50-state Natural Heritage Network. In 1995, EPA's Office of Information Resource Management began exploring the feasibility of developing a spatial data sharing agreement among EPA, The Nature Conservancy (TNC), its Heritage Network, the Association for Biodiversity Information and other agencies. The group then

began working on the formation of data standards and a draft model sharing agreement with the Heritage Network. The goal is to provide national level data products/services, including a county/watershed Element Occurrence (EO) dataset that would be available on the Internet; an extranet EO dataset at the township and quad level; and staffing to query precise data sets. ([cahanap.concepcion](mailto:cahanap.concepcion))

**Mitigation Banking Study.** On July 17, we met with representatives from Batelle to discuss a proposed scope of work for a research effort that would assess the experiences that local governments have had in establishing and operating wetlands mitigation banks. Information collected by Batelle will be summarized so that it may be used by EPA to evaluate locally-sponsored mitigation bank proposals and to provide technical assistance to local governments interested in establishing mitigation banks. ([kelsch.thomas](mailto:kelsch.thomas))



## **EDUCATION/OUTREACH**

**Wetlands and Local Governments News Article.** The Wetlands Division, in conjunction with the International City/County Managers Association (ICMA) and the Southwest Florida Water Management District

(SWFWMD), co-authored a news article for inclusion in ICMA's monthly magazine. The magazine, known as PM Public Management, is designed to provide information to local city and county officials on a range of topics including environmental and fiscal issues. The article focuses on opportunities to protect wetlands and watersheds and the benefits to local governments. It will likely be included in the October issue of the magazine. (parrish.reginald or boots.michael)

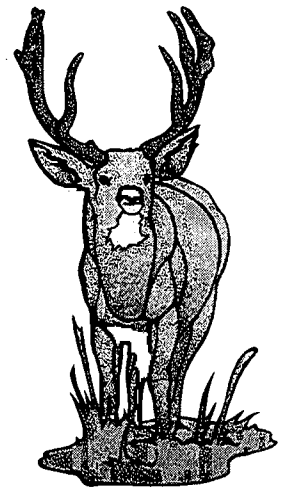
**Report on Water Tables and Soil Morphology.** The Wetlands Division received the final report "Water Tables and Soil Morphology: Quantification Using Simulated Hydrographs" from L. Peter Galusky, Martin C. Rabenhorst and Adel Shirmohammadi of the University of Maryland. The Wetlands and Aquatic Resources Regulatory Branch funded the study. The authors investigated the relationship between long-term water table depths and soil morphological indicators of wetland hydrology. The study demonstrated the possibility of developing region-specific, quantitative hydric soil indicators for use in wetland jurisdictional determinations. The authors presented a paper based on the report at the recent meeting of the Society of Wetland Scientists in Bozeman, MT, and the paper will be submitted for publication in an appropriate peer-reviewed scientific journal. (fritz.michael)

**Chesapeake Bay Program.** The Chesapeake Bay Program has added online "Protecting

Wetlands : Tools for Local Government in the Chesapeake Bay Region" at the url: [http://www.epa.gov/r3chespk/cbp\\_home/localgov/wetlands/noframes/chap1toc.htm](http://www.epa.gov/r3chespk/cbp_home/localgov/wetlands/noframes/chap1toc.htm)  
The document is divided into the following chapters: 1. Wetlands and the Role of Local Government; 2. Planning; 3. Regulation; 4. Incentives; 5. Acquisition; 6. Technical Assistance, Education and Outreach; and 7. Case Studies. For more information on the Bay Program, call (800)YOUR-BAY. (cahanap.concepcion)

**Reprinting *Protecting Natural Wetlands* Document.** WD has arranged to reprint 1000 copies of "Protecting Natural Wetlands: A Guide to Stormwater Best Management Practices." This document describes the potential benefits, limitations, and appropriate application of best management practices (BMPs) that can be implemented to protect the functions of natural wetlands from the impacts of urban stormwater discharges and other diffuse sources of runoff. Copies will be available from the toll free contractor-operated Wetlands Information Hotline (1-800-832-7828). (cahanap.concepcion)

**Wetlands Website.** The new Wetlands Division website went on-line on August 25, sporting an updated look and a considerable increase in information. A briefing for OWOW management was held to complete the process to improve the site and make it more user-friendly. (jaynes.brenda)



## LOCAL ACTIVITIES

**National Association of Counties.** The Wetlands Division processed a cooperative agreement with the National Association of Counties (NACo). The Division is working with NACo and other OWOW Divisions to develop smart growth outreach materials for local communities. (parrish.reginald)

**Terrene Institute.** The Wetlands Division processed a grant with Terrene Institute. (<http://www.terrene.org/>) This grant will provide funding for the development and support of the 1998 American Wetlands Month Conference, to be held next April, and for the development of wetlands outreach materials and activities to support local and municipal officials. (cahanap.concepcion)

**League of Women Voters Education Fund.** The Wetlands Division processed a cooperative agreement with the League of Women Voters

Education Fund (LWVEF). The League is providing outreach to local communities through a series of small grants which local League members use for wetland field trips, videos, workshops, and contests. (parrish.reginald)

### **PRIVATE/PUBLIC COOPERATION**

**Golf and the Environment.** On July 28 and 29, Wetlands Division staff visited two golf courses in New England where attempts are being made to model environmentally responsible golf course construction and maintenance. The "Widow's Walk" course in Scituate, MA, was designed to be a national model and study site for an "ecologically enriched" golf course. The course, which opened in early July, was built on a former sand and gravel quarry that contains one of the Town of Scituate's drinking water wells. The environmental stewardship challenge before the town (which owns the land) was to stabilize the soil, bring back the native vegetation, and protect the water supply. Golf course architect Michael Hurdzan, a steering committee member of the partly EPA-sponsored "Golf and the Environment" project, designed a golf course that would meet these objectives as well as model integrated pest management and test various turf and water-use practices. The course asks players to refrain from searching for stray golf balls in ecologically sensitive areas, and to accept the minor inconveniences of brown areas of turf and dense shrubbery near the fairways.

Staff also met with the superintendent of the Rhode

Island Country Club in Barrington, RI, along with representatives of the Providence-based non-profit organization "Save the Bay." In order to pursue its goal of protecting and restoring Narragansett Bay, Save the Bay seeks partnerships with local golf courses, many of which own land that includes marshes either directly on the Bay or on its tributaries. Save the Bay works with volunteers to monitor salinity, basic hydrology, and vegetation in bay marshes, and intends to make headway by partnering with golf course owners to gain access to the marshes on the fringes of the courses. The course at the Rhode Island Country Club has been opened to monitoring by Save the Bay, and there are plans to modify existing artificial hydrology to restore the herring spawning functions of nearby freshwater lakes, as well as to increase salinity levels in the lower reaches of a stream to suppress *Phragmites* growth. Information from these field visits will supplement the efforts of the Golf and the Environment project to publicize environmentally responsible golf course practices. (witten.matthew)

### **Meeting with International Council of Shopping Centers.**

On July 15, WD met with Charlie Grizzle and Regina Schofield, representing the International Council of Shopping Centers, with regard to their ideas for proposed replacement permits for Nationwide Permit 26. The two had recently met with staff from the Corps of Engineers, who signified their intent to propose replacements in the Federal Register by February of 1998. (goodin.john or boots.michael)

## **REGULATORY ACTIVITIES**

### **Maryland: Intercounty**

**Connector.** On August 1, 1997, EPA Region 3 (Philadelphia) submitted comments on the draft environmental impact statement (DEIS) for the proposed Intercounty Connector Maryland highway project to the Federal Highway Administration. The purpose of the project is to improve east-west transportation between the I-270 corridor and the I-95 corridor. The Region rated one of the three proposed alignment alternatives in the DEIS as Environmentally Unacceptable, in part based on potential impacts to wetlands and aquatic resource concerns. (williams.chris or miller.clay)



**Connecticut: Route 6.** On July 23, 1997, the Corps of Engineers Waterways Experiment Station released a report comparing the environmental impacts of three alternative alignments for the proposed Route 6 highway project in Connecticut. Specifically, the report reviews a recent proposal by the State and two other proposed alignments and concludes that, while the State's alternative is not the least damaging, the different types of impacts associated with each alternative must be weighed against one another. The State has not yet filed an application with the Corps District. WD met with representatives from EPA's New England Region (Boston) and a representative of the U.S. Fish

and Wildlife Service on July 22 to discuss technical issues relating to project alternatives currently under consideration. (ettinger.john)

**Mississippi: Pine Hills Casino and Resort.** On July 28, 1997, the Mobile Corps District notified Region 4 (Atlanta) of its intent to issue a Section 10/404 permit for the construction of a casino/resort in the Bay of St. Louis, Harrison County, Mississippi. The Region is concerned about secondary and cumulative impacts generated by the casino and related development, and recommends that a comprehensive study be undertaken by federal, state and local agencies to evaluate the effects of growth on the Mississippi Gulf Coast. The Region objects to permit issuance as proposed and recommended to Assistant Administrator Perciasepe that the case be elevated to the Assistant Secretary of the Army under Section 404(q). (williams.chris or miller.clay)

**Virginia: Lynnhaven River Dredging.** On July 22, the Virginia Marine Resources Commission elected not to issue a Coastal Zone Consistency permit for the proposed maintenance and new dredging of the Western Branch of the Lynnhaven River in Virginia Beach, Virginia. Consistent with 33 CFR 320.3(b), a Federal permit can not be issued until the State has provided a consistency determination under the Coastal Zone Act Reauthorization Amendments. This decision effectively prevents the proposed project from proceeding in its current form. The Corps had previously notified the Region of its intent to issue a permit. EPA Region 3

(Philadelphia) was considering initiating a Section 404(q) elevation of the Section 10/404 permit to address concerns similar to those that provided the basis for the State denial. (williams.chris or miller.clay)

## INTERNATIONAL ACTIVITIES

**International Workshop on the Beneficial Uses of Dredged Material.** WD made several presentations and participated on two panels at the International Workshop on the Beneficial Uses of Dredged Material in Baltimore, MD, from July 28-August 1. In addition, WD's John Meagher delivered a keynote address at the opening session. The Army Corps of Engineers hosted the workshop with support from EPA and other Federal agencies. Several hundred participants from some 40 countries participated. The last conference of this type was held in New Orleans in December 1992. (goodin.john)

## OTHER

**"Managing Growth" Conference.** On July 24-26, 1997, the Wetlands Division participated in the "Managing Growth: Learning from the Oregon and Portland Experiences" conference in Portland, Oregon. The seminar was attended by a diverse group of representatives from Federal, State, regional, and local governments, environmental and agricultural communities, and development interests. The conference focused on the transferability of Portland's regional growth management efforts and Oregon's statewide planning law to other communities across the nation that are working to balance natural resource protection with

their economic development goals. (boots.michael)

**Staffing Addition.** Christopher Teng has joined the Wetlands Division as an intern for the next six months. Chris earned his Bachelor's degree from the University of California, San Diego and his Master's degree in urban and regional planning from the University of California, Irvine. His primary duties will include supporting the Section 404 hot cases team and developing summaries of Clean Water Act Section 404 "success stories" from across the nation. (teng.christopher)

If you would like to be added to the Swamp Things Mailing List or have comments or suggestions on Swamp Things, please let us know by contacting Stephanie Peters, who handles production and distribution:

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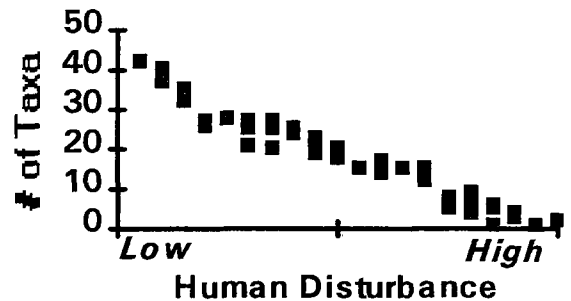
**Biological Assessment of Wetlands  
Workgroup (BAWWG)  
1st Technical Meeting**

**The Biological Assessment of Wetlands Workgroup (BAWWG) held its first technical meeting from July 8-10, 1997 at the Patuxent Wildlife Research Center in Laurel, Maryland. The theme of the meeting was developing metrics and multimetric indices to assess the health or "biological integrity" of wetlands. BAWWG members currently include representatives from six states (FL, ME, MN, MT, OH, ND), federal agencies (e.g., EPA, USGS, NRCS, USFWS, Smithsonian), and several universities.**

## Day 1 - Metrics

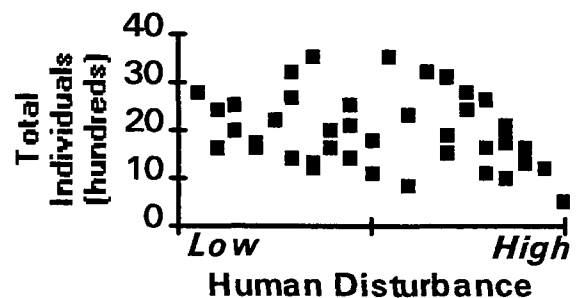
During the first of three days, the workgroup discussed issues related to developing metrics for individual wetland assemblages, including plants, algae, amphibians, birds, and macroinvertebrates. Scientists can measure many biological attributes of wetlands such as the diversity of amphibians or the number of pollution-tolerant insects. Some of these attributes will provide valuable information about biological integrity and other attributes will not. The goal is to identify metrics, which are attributes that show an empirical and predictable change in value along a gradient of human disturbance. The gradient of human disturbance can represent the amount of logging, agriculture, development, impervious surfaces, or other land use or activity in a watershed depending on the purpose of the bioassessment. An example of a metric is the diversity and richness of macroinvertebrates (e.g., insects, snails, clams, crayfish). Several states have found that macroinvertebrate richness will often decrease as a wetland becomes increasingly degraded by human activities (Figure 1). For illustrative purposes, Figures 1-5 were developed using hypothetical data, but are based on figures that were presented by Dr. James Karr (University of Washington) at the conference. As Figure 1 shows, there is a clear response to increasing human disturbance and this attribute could be used as a metric.

### Figure 1: Macroinvertebrate Taxa Richness at 40 Wetlands



**In contrast, total abundance of macroinvertebrates is often more dependent on natural environmental variability of wetlands and does not show a reliable change in response to human disturbance (Figure 2). As Figure 2 shows, there is no clear response to increasing human disturbance and this attribute could not be used as a metric. In these two examples, total taxa richness of macroinvertebrates could serve as a metric and total abundance could not.**

**Figure 2: Total Macroinvertebrate Abundance in 40 Wetlands**



**In general, individual workgroup members are still in the preliminary stages of identifying and testing potential metrics, particularly for birds, amphibians, plants, and algae. Most of the current research is being conducted on macroinvertebrates and plants in depressional wetlands with emergent and submerged vegetation. Further research is needed in other wetland types, especially in wetlands that have saturated soils but lack standing water for most or all of the year.**

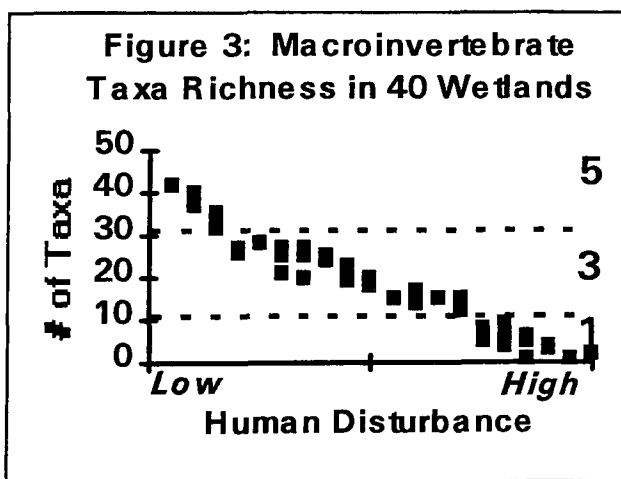


## Day 2 - Field Day

During the second day, the workgroup visited three depressional wetlands in eastern Maryland that represented a gradient of human influence. One wetland was minimally impacted by human activities and the other two wetlands were restored wetlands on agricultural land. Of the two restored wetlands, one was in poor condition and one was in moderate condition compared to the minimally impacted wetland. The workgroup compared and tested different sampling techniques at each wetland and observed how the biological assemblages changed across the gradient of human disturbance. The workgroup also discussed issues related to classifying wetlands and developing quantitative measures of human disturbance.

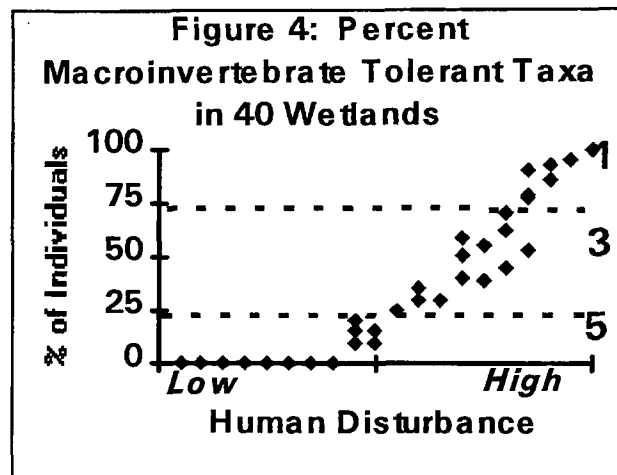
## Day 3 - Combining Metrics

During the last day, the workgroup discussed methods of assigning scores to metrics and of combining individual metrics into an index of biological integrity (IBI). Typically, an IBI is formed by combining at least 7 metrics from one biological assemblage (e.g., plants). One approach of combining metrics into an IBI is to assign scores of 1, 3, or 5 to the metrics according to how they respond to human disturbances. For example, the diversity and richness of macroinvertebrate taxa may consistently decrease with increasing human disturbance (Figure 3). In this case, we could assign a score 1 to indicate poor conditions, 3 to indicate moderate conditions, and 5 to indicate minimally impacted conditions (Figure 3).

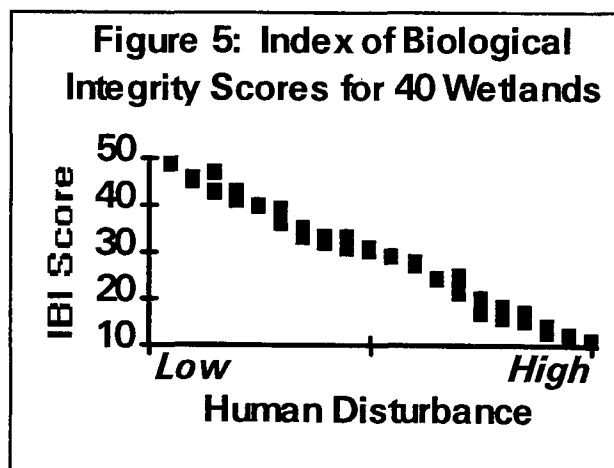


Another metric, the number of tolerant taxa, may increase with increasing human disturbance (Figure 4). In this case, a wetland dominated by

tolerant taxa would receive the lowest score and a wetland with a small percentage of tolerant taxa would receive a high score (Figure 4).



If 10 metrics were scored in this manner, then the scores could be added together to form the index of biological integrity (IBI) with potential scores ranging from 10 (maximally impacted) to 50 (minimally impacted). The IBI scores form a relatively straight line when plotted against the gradient of human disturbance (Figure 5).



After developing the IBI, the scientists would then test it on another sample of wetlands to see if it accurately detects the effects of human disturbances on the biological assemblage. After testing and validating the index, they could directly measure the health of similar wetlands without having to measure every attribute. They would only have to measure the 10 metrics and some basic chemical and physical characteristics of the wetlands. The chemical and physical

characteristics will help them diagnose the source of impairment and develop plans to reduce the impacts. Box 1 lists the potential applications for wetland bioassessment techniques.

### **Box 1: Benefits and Applications of Bioassessment Methods**

Current water quality monitoring techniques rely on surrogates, such as the use of chemical water quality data or laboratory-based toxicity criteria, to predict impacts to biological communities. Conversely, biological assessments (bioassessments) provide direct, site-specific measurements of the biological integrity of aquatic plant and animal assemblages. Unlike conventional methods, bioassessments can detect cumulative impacts of multiple, long-term, and intermittent impacts. Bioassessments can also detect the impacts of physical and biological stressors to an aquatic habitat, such as hydrologic modification, habitat alteration, and introduction of exotic species.

States can use bioassessment techniques for a variety of applications, including:

- Developing water quality standards and numeric biological criteria.
- Evaluating performance of wetland restoration projects.
- Identifying the "early warning" signals of wetland degradation.
- Targeting protection and restoration efforts more effectively.
- Prescreening habitats before using more expensive chemical analyses of water quality.
- Providing scientifically-sound monitoring data for watershed protection approaches.
- Providing a basis for developing aquatic ecological risk assessments.

### **Next Steps for BAWWG**

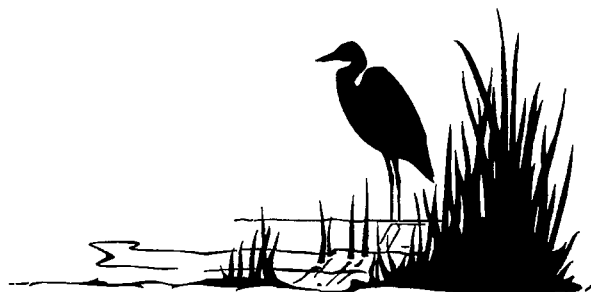
During the meeting, BAWWG formed three focus groups to further investigate issues related to (1) macroinvertebrates, (2) plants, and (3) the relationship between biological assessments and the hydrogeomorphic (HGM) approach to assessing wetland functions. BAWWG will continue to hold monthly conference calls and the next BAWWG conference is scheduled for October 1997. During the conference calls and meetings, the workgroup will examine a variety of topics (Box 2).

### **Box 2: Recurring Workgroup Topics**

- selecting and testing metrics
- scoring metrics
- combining metrics into a multimetric Index of Biological Integrity
- study design (targeted vs. random sampling)
- wetland classification
- reference conditions
- data analysis
- consistent use and definitions of terms
- standard sampling protocols
- relationship with the hydrogeomorphic (HGM) approach to assessing wetland functions

**The workgroup plans on writing technical papers on some of these topics to help other states and federal agencies develop biological assessment capabilities. BAWWG also plans on developing a mechanism to peer review proposals for wetland biological assessment projects.**

**If you are more interested in learning more about BAWWG, please contact Tom Danielson at (202) 260-5299 or [danielson.tom@epamail.epa.gov](mailto:danielson.tom@epamail.epa.gov).**



# ***Agenda for A Workshop on River Corridor and Wetlands Restoration***

**Tuesday, September 23, 1997**

**U.S. EPA Contact: John Pai, 202-260-8076, e-mail [pai.john@epamail.epa.gov](mailto:pai.john@epamail.epa.gov)**

**8:00-8:30**      **Registration**

**8:30-9:00**      **Welcome/Opening. *Michael Davis, Deputy Assistant Secretary for Civil Works, U.S. Army, and Chair, Interagency Wetlands Working Group, and Robert H. Wayland III, EPA Director, Office of Wetlands, Oceans and Watersheds***

**9:00-10:00**      **Panel Discussion**

**Subject:**      ***Everybody Gets into the Act - A Case Study of Building a Diverse Partnership for the Cooper River in South Carolina***

**Facilitator:**      ***Richard A. Slack, Amoco Chemicals Corporation***

**Panel**      ***- Richard Stoney, Stoney Goulden Company***

**Members:**      ***- Henry Richardson, Mount Pleasant Police Department***

***- Mel Goodwin, The Harmony Project***

***Panel members will speak for the Cooper River Corridor Project Team and discuss their long and fruitful journey leading to the successful protection and restoration of the Cooper River corridor.***

**10:00-10:30**      **Break**

**10:30-11:30**      **Panel Discussion**

**Subject:**      ***A River Runs through It - Landscape, Larger Scale Restoration Efforts***

**Facilitator:**      ***Ronald Tuttle, National Landscape Architect, Natural Resources Conservation Service***

**Panel**      ***- David P. Braun, Hydrologist/Water Quality Specialist, The Nature Conservancy. David will discuss TNC's new Freshwater Initiative to enhance freshwater ecosystem biodiversity in all parts of the U.S.***

**Members:**      ***- Ann Lackey, Riparian Buffer Initiative Coordinator, Chesapeake Bay Research Consortium. Ann will discuss the Chesapeake Bay Riparian Forest Buffer Initiative in the States of Maryland, Virginia and Pennsylvania***

***- Shari Schafflein, Water Quality Manager, Washington Department of Transportation. Shari will present Washington DOT's movement from a project-by-project approach to a "holistic" Watershed Restoration and Enhancement Strategy. This comprehensive approach involves working with all levels of government and the public to identify watershed restoration and enhancement projects to be implemented by transportation agencies in the course of their work.***

**11:30-12:30**      **Panel Discussion**

**Subject:**      ***Our Corner of the World - Grassroots, Local Scale Restoration Efforts***

**Facilitator:**      ***Avery L. Patillo, Program Coordinator, Urban Resources Partnership in Chicago***

**Panel**      ***- Ann Riley, Director Waterways Restoration Institute. Ann will discuss "Daylighting of Urban Streams." This is a relatively new approach in which streams are removed from underground culverts or concrete covers and restored to a semblance of their historic natural condition***

**Members:**      ***- Mike Raab, Deputy Commissioner, Environmental Compliance, Erie County, New York. Mike will discuss the Wetlands and Watersheds Stewardship Project (Stewardship Project) in Erie County, New York. The Stewardship Project is a collaborative partnership among local governments (county and town), private industry representatives, AmeriCorps and youth groups. The Stewardship Project goals are to train and educate disadvantaged youth to restore fish and wildlife habitat and improve public access along the Buffalo River corridor.***

***- Dave Putnam, U.S. Fish and Wildlife Service and Sara Nicholas, National Fish and Wildlife Foundation. Sara and Dave will discuss the private-lands wetlands restoration program underway in Pennsylvania. The program is a partnership effort led by the FWS but actively joined by a wide range of groups, including the USDA/NRCS, universities, Pheasants Forever, Ducks Unlimited, NFWF and others.***

- 12:30-1:45      **Group Lunch:**    *Luncheon Speaker Paul Johnson, Chief of USDA's Natural Resources Conservation Service.*
- 1:45-2:45      **Large Group Response Exercise - Ideas from Participants for Advancing a Restoration Agenda.**    *Facilitator: Ken Orth, U.S. Army Corps of Engineers*
- 2:45-3:15      **Break**
- 3:15-3:30      **Restoration Web Site, John Pai, U.S. EPA**
- 3:30-4:00      **Summary of Group Responses**
- 4:00-4:30      **Future of Partners for Restoration**
- 4:30-5:15      **Project Marketplace - Sharing Tools and Making Partnership Matches.** *In the exhibit area, participants with candidate projects will display them and identify funding, in-kind or technical support needs for organizations interested in partnering.*
- 5:15              **Unwind**

## CORRECTION

In the last issue of SwampThings, we invited you to try EPA's new Wetlands Homepage on the Internet. That turned out to be premature, as our improved and vastly expanded home page was not yet operational. It is now, so please give us another try at:

<http://www.epa.gov/owow/wetlands>

Many thanks to summer intern Brenda Jaynes from the University of Pennsylvania for her work on our web page renovation.



**Visit other OWOW sites on the Internet:**

<http://www.epa.gov/owow>  
<http://www.epa.gov.surf>



For additional information on wetlands and wetlands programs, call EPA's Toll Free Wetlands Information Hotline (contractor operated) at:  
**1-800-832-7828**

